44 Quick Stop (PWS 3140216)
SOURCE WATER ASSESSMENT REPORT

RGT 3-11-04

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State of Idaho
Department of Environmental Quality

Under the Federal Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. The Idaho Department of Environmental Quality (DEQ) is completing the assessments for all Idaho public drinking water systems. The assessment for the 44 Quick Stop drinking water source is based on a land use inventory within a 1,000 foot radius of the well source, sensitivity factors associated with the source, and characteristics associated with either your aquifer or watershed in which you live.

This report, Source Water Assessment for the 44 Quick Stop (PWS # 3140216) describes the public drinking water system, the associated potential contaminant sources located within a 1,000 foot boundary around the drinking water source, and the susceptibility that may be associated with any associated potential contaminants. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this system. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the 44 Quick Stop water system.**

The 44 Quick Stop is located north of Caldwell in Canyon County (see Figure 1). The non-community transient water system has one well located on the south side of the convenience store. The system serves a population of approximately 200 with one connection. Water quality tests conducted for the well during 2003 do not show elevated levels of chemicals. Nitrate was detected in the water at a concentration of 0.24 mg/L, which is well below the maximum contaminant level of 10 mg/L.

The potential contaminant sources identified within the delineated area include wintering of sheep, major highways, a septic system, and an underground gas tank (see Table 1 and Figure 2). The wintering of sheep could be a potential source of inorganic chemical (IOC, e.g. nitrates) contaminants and microbial contaminants (M, e.g. total coliform). If an accidental spill occurred on Highways 30 or 44, or on the Interstate 84 exit/entrance ramp, IOC contaminants, volatile organic chemical (VOC, e.g. petroleum products) contaminants, synthetic organic chemical (SOC, e.g. pesticides) contaminants and microbial contaminants could be added to the ground water. A septic system is located within 500 feet of the well, and could be a source of IOC and microbial contaminants. The underground gas storage tank is located within 200 feet of the well and could potentially be a source of VOC and SOC contaminants. In addition, the land use in this area is predominantly irrigated agriculture and has a high county-wide nitrogen fertilizer usage and a high county-wide herbicide usage.

Table 1. 44 Quick Stop Potential Contaminant Inventory

Map ID	Source Description	Source of Information	Potential Contaminants[1]
1	Wintering of Sheep	Enhanced Inventory	IOC, M
	Interstate 84 Exit/Entrance Ramp	GIS Map	IOC, VOC, SOC, M
	Highways 30 and 44	GIS Map	IOC, VOC, SOC, M
	Septic System	GWUDI Field Survey	IOC, M
	Underground Gas Tank	GWUDI Field Survey	VOC, SOC

[1]IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical, M= microbial

The susceptibility of the drinking water source to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity or system construction, the land use characteristics, and potentially significant contaminant sources. Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in another category(ies) results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, IOCs (e.g. nitrates, arsenic) contaminants, VOCs (e.g. petroleum products), SOCs (e.g. pesticides) contaminants, and microbial contaminants (e.g. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each drinking water source is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement.

The well's system construction was rated low. The well was drilled in December of 1998 to a depth of 288 feet below ground surface (bgs). The static water level at the time of drilling was 82 feet bgs. The well has a 6 inch diameter casing from the surface to 273 feet bgs. The casing is perforated from 276 to 286 bgs and extends into non-water bearing clay. The well casing thickness is 0.280 of an inch. The well's bentonite annular seal at the ground surface extends 82 feet bgs into non water-bearing cemented sand and gravel. According to the 2003 sanitary survey, the wellhead seal is in good condition and the well casing is 12 inches above the ground. With respect to flooding vulnerability, the well is located outside a 100 year floodplain, the casing is adequately set above ground, and has a downturned, screened casing vent.

The hydrologic sensitivity was rated low for the well. The ranking was due to the presence of clay layers with a cumulative thickness of 54 feet in the subsurface to provide a low-permeability barrier between possible surface contaminants and the water-producing zone, greater than the required 50 feet cumulative thickness identified in the SWA Plan (DEQ, 1999). The soil drainage class was mainly comprised of poor to moderately drained soils, and the vadose zone (the area from land surface to the water table) was mainly comprised of sand, which both contributed to the low rating. However, the depth to first ground water identified was at 97 feet bgs, less than the 300 feet identified in the SWA Plan (DEQ, 1999) required to achieve a lower score.

The 44 Quick Stop rated high (Table 2) for potential contaminant sources and land use for VOCs (e.g., petroleum products) and SOCs (e.g., pesticides). The underground gas storage tank, the presence of Highways 44 and 30, and the Interstate 84 entrance/exit ramps within the delineated source water assessment area contributed to the high rankings. The 44 Quick Stop also rated high for potential contaminant sources and land use for IOCs (e.g., nitrates) and microbial contaminants (e.g. total coliform). In addition to the highways and interstate, the septic system and the wintering of sheep, along with the high county use of nitrogen fertilizer, herbicide and total agrichemical use contributed to the high ranking. Another factor adding to the IOC ranking is that the 44 Quick Stop well is located within a nitrate priority area.

The final susceptibility ranking for the well is moderate for IOC, VOC, SOC, and microbial contaminants (see Table 2). A copy of the susceptibility analysis for 44 Quick Stop well along with a map showing potential contaminant sources are included with this summary. Information regarding the potential contaminants within the 1,000 foot boundary have been summarized and included in Table 1.

Table 2. Summary of the 44 Quick Stop Susceptibility Evaluation

	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory[2]				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbial		IOC	VOC	SOC	Microbial
Well	L	H	H	H	H	L	M	M	M	M

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility
[2]IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical, M= microbial

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the 44 Quick Stop water system, drinking water protection activities should focus on evaluating possible sources of contamination such as those identified in this assessment, and other sources including animal grazing and wildlife near the drinking water source. To protect the source water, the water system operator should consider building infrastructure to restrict access to the well head, as suggested in the 2002 Sanitary Survey Report. Working with the local soil and conservation district and Canyon County will better inform the water system operator of chemicals that may be applied or stored near the drinking water well. The water system operator is also encouraged to develop a drinking water protection plan to document and rank potential contaminant sources, assess protection efforts, and provide education for staff and the public about the drinking water. Partnerships with state and local agencies and industry groups should be established and are critical to success. A strong public education program should be a primary focus of any drinking water protection plan as the delineations are near urban and residential land uses areas. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors near the delineations; therefore the Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

Drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices).

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments. For assistance in developing protection strategies please contact Pamela Smolczynski in the Idaho Department of Environmental Quality Boise Regional Office at (208) 373-0461.

Water suppliers serving fewer than 10,000 persons may contact Ms. Melinda Harper, Idaho Rural Water Association, at 208-343-7001 (mlharper@idahoruralwater.com) for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few heads to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of storm water runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (IDEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25% of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RCRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by IDEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory

References Cited

Idaho Department of Environmental Quality, 1999. Source Water Assessment Plan.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

The final scores for the **44 Quick Stop Well** susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.27)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

> 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name : 44 Quick Stop Well# : WELL
Public Water System Number 3140216 3/9/04 1:55:42 PM

1. System Construction		SCORE				
Drill Date	8/29/02					
Driller Log Available	YES					
Sanitary Survey (if yes, indicate date of last survey)	YES	2002				
Well meets IDWR construction standards	YES	0				
Wellhead and surface seal maintained	YES	0				
Casing and annular seal extend to low permeability unit	YES	0				
Highest production 100 feet below static water level	YES	0				
Well located outside the 100 year flood plain	YES	0				
Total System Construction Score		0				
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	YES	0				
Vadose zone composed of gravel, fractured rock or unknown	NO	0				
Depth to first water > 300 feet	NO	1				
Aquitard present with > 50 feet cumulative thickness	YES	0				
Total Hydrologic Score		1				
3. Potential Contaminant / Land Use - ZONE 1A			IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND		2	2	2	2
Farm chemical use high	YES		2	2	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO		NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A			4	4	4	2
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)	YES		5	4	4	5
(Score = # Sources X 2) 8 Points Maximum			8	8	8	8
Sources of Class II or III leacheable contaminants or	YES		8	4	4	
4 Points Maximum			4	4	4	
Zone 1B contains or intercepts a Group 1 Area	YES		2	0	0	0
Land use Zone 1B	Greater Than 50% Agricultural Land		4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B			18	16	16	12
Cumulative Potential Contaminant / Land Use Score			6	5	5	5
4. Final Susceptibility Source Score			7	6	6	6
5. Final Well Ranking			Moderate	Moderate	Moderate	Moderate